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Sir:

Transmitted herewith for filing is the patent application of

INVENTOR OR APPLICATION IDENTIFIER: Ju-Hwan KIM

FOR: FACSIMILE MAIL BOX SERVICE SUBSCRIBER APPARATUS AND OPERATING METHOD THEREOF

Enclosed are:

1. ☒ 19 pages of specification, claims, abstract
2. ☒ 4 sheets of FORMAL drawing.
3. ☒ 2 pages of newly executed Declaration & Power of Attorney (original).
4. ☒ Priority Claimed to Korean Appln. No. 49004/1999, whose entire disclosure is incorporated herein by reference.
5. ☐ Small Entity Statement.
6. ☐ Information Disclosure Statement, Form PTO-1449 and reference.
7. ☒ Assignment Papers for LG Electronics Inc. (cover sheet, assignment & assignment fee).
8. ☒ Certified copy of Korean Patent Application No. 49004/1999 filed November 5, 1999.
9. ☒ Two (2) return postcards.
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☒ Prepaid Postcard-Stamped Filing Date & Returned with Unofficial Serial Number.
10. ☒ Authorization under 37 C.F.R. §1.136(a)(3).
11. ☐ Other:

CLAIMS AS FILED

For	No. Filed		No. Extra	Rate	Fee
Total Claims	13	- 20	0	X \$18.00	\$0.00
Indep. Claims	3	- 3	0	X \$80.00	\$0.00
Multiple Dependent Claims (If applicable)				X \$270.00	\$0.00
				BASIC FEE	\$710.00
				TOTAL FILING FEE	\$710.00

- ☐ This is a Continuation-in-part (CIP) of prior application No: _____ filed _____. Incorporation By Reference-The entire disclosure of the prior application is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
- ☐ Amend the specification by inserting before the first line the sentence:
 -This application is a continuation-in-part of Application Serial No. _____ filed _____.--
- ☒ A check in the amount of \$710.00 (Check #9702) is attached.
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- ☒ Any patent application processing fees under 37 C.F.R. 1.17.
- ☒ Any filing fees under 37 C.F.R. 1.16 for presentation of extra claims.

FLESHNER & KIM, LLP

Daniel Y.J. Kim
 Registration No. 36,186

Correspondence Address Below:

P.O. Box 221200

Chantilly, VA 20153-1200

(703) 502-9440 DYK/iam

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FACSIMILE MAIL BOX SERVICE SUBSCRIBER APPARATUS AND OPERATING METHOD THEREOF

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a facsimile mail box service system, and more particularly to a facsimile mail box service subscriber apparatus and an operating method thereof.

2. Description of the Background Art

Generally, a facsimile mail box service apparatus receives a facsimile data through a PSTN from a facsimile terminal and stores it, and then transmits the facsimile data to a facsimile terminal of the other party.

The facsimile mail box service apparatus is able to transmit a document information to a plurality of terminals by one-time manipulation or set a time and automatically deliver the document information. In addition, even though the facsimile terminal of the other party is engaged, the user does not need to wait for it. And, in case of transmitting document information overseas, the user may choose a less-chargeable time zone relying on a time difference.

Figure 1 is a schematic view showing a construction of a general facsimile mail box service network in accordance with a conventional art.

As shown in the drawing, in case that a facsimile terminal 1 transmits a facsimile data to a facsimile terminal 2, a PSTN switching center 4 receives the facsimile data transmitted from the facsimile terminal 1 through a PSTN 3 and

transmits it to a facsimile mail box service subscriber apparatus 5. Upon receipt of the facsimile data, the facsimile mail box service subscriber apparatus 5 stores it in a storing unit.

Thereafter, the facsimile data stored in the storing unit of the facsimile mail box service subscriber apparatus is to be transmitted to the destination facsimile terminal 2, the facsimile mail box service subscriber apparatus 5 transmits the facsimile data stored in the storing unit to the destination facsimile terminal 2.

Figure 2 is a schematic block diagram of the general facsimile mail box service subscriber apparatus 5 in accordance with the conventional art.

As shown in the drawing, the facsimile mail box service subscriber apparatus 5 includes a CPU 11, a facsimile data storing unit connection unit 12, a buffer memory 13, a PCM highway matching unit 14, a facsimile controller 15, a memory, a facsimile modem 17, a synchronous processor 18 and a control board information exchange memory 19.

The CPU 11 controls the whole facsimile mail box service subscriber apparatus. The facsimile data storing unit connection unit 12 controls matching with a control board and an external storing unit. The buffer memory 13 buffers a data transmitted and received between itself and the external storing unit. The PCM (Pulse Code Modulation) highway matching unit 14 recognizes a facsimile message applied through a PCM highway, converts the corresponding facsimile message to an analog signal and transmits it to the facsimile modem 17.

The facsimile controller 15 processes a facsimile protocol and facsimile data. The memory 16 stores the facsimile data. The facsimile mode 17 processes the analog facsimile data applied from the PCM highway matching unit 14 on the basis of an ITU-T.4 protocol.

The synchronous processor 18 synchronizes the message data applied or transmitted through the PCM highway. The control board information exchange memory 19 informs the control board of the recording completion of the buffer memory 13 under the control of the CPU 11.

5 The operation of the facsimile mail box service subscriber apparatus constructed as described above will now be explained with reference to the accompanying drawings.

1) Recording operation of the facsimile message (Receiving operation)

10 The CPU 11 recognizes a facsimile message applied through the PCM highway matching unit 14 and informs the facsimile controller 15 of the receipt of the facsimile message through the facsimile data storing unit connection unit 12.

The facsimile controller 15 informs the facsimile modem 17 of the arrival of the facsimile message, and at this time, the PCM highway matching unit 14 receives a synchronous signal from the synchronous processor 18, converts the PCM signal applied through the PCM highway to an analog signal and transmits the analog signal to the facsimile modem 17.

15 The facsimile modem 17 processes the analog signal transmitted from the PCM highway matching unit 14 to restore it to a data according to the protocol recommended by the ITU-T.4, and the facsimile controller 15 reads the data restored by the facsimile modem 17, stores it in the memory 16 and records it in the buffer memory 13 through the facsimile data storing unit connection unit 12.

20 Thereafter, the data is completely recorded in the buffer memory 13, the facsimile data storing unit connection unit 12 outputs an interrupt signal to the CPU 11 to inform of the completion of recording.

Then, the CPU 11 informs the control board of the recording completion of the buffer memory 13 through the control board information exchange memory 19, and the corresponding control board reads the data stored in the buffer memory 13 and stores it in an external storing unit.

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2) Reproducing operation of the facsimile message (Transmitting operation)

The operation for transmitting the facsimile message is performed in the reverse order of the above-described recording operation.

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However, in the operation of the facsimile mail box service, there may occur an error due to the line when the facsimile message is transmitted and received.

As for the conventional facsimile mail box service subscriber apparatus, in case where only the ECM (Error Correction Mode) function, that is, a selective matter of the ITU-T.30 protocol, is used in order to detect and restore an error as generated, since the facsimile terminal of the other party also should have the ECM function as well. Therefore, if the facsimile terminal of the other party doesn't have the ECM function, it is not possible to detect and restore an error.

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In addition, in the conventional facsimile mail box service subscriber, in case where a facsimile image binary data conversion algorithm is used to detect and restore an error as generated, much load is produced by software and real-time processing is not easy.

25 SUMMARY OF THE INVENTION

Therefore, an object of the present invention is to provide a facsimile mail box service subscriber apparatus which is capable of providing, with high reliability, various service such as error detection through analysis of an ECM, a selective matter of the ITU-T.30, and a binary data, and a corresponding correction and request for re-transmission, capable of storing a facsimile data in a binary form in a storing unit, and capable of being readily adopted to an applied field such as an Internet facsimile according to a construction of a system afterwards, and its operating method.

To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described herein, there is provided a facsimile mail box service subscriber apparatus including: an image memory for storing a facsimile image binary data; and a facsimile image data processor for receiving a coded facsimile data from a facsimile controller, reverse-coding the facsimile data to a binary data, storing it in the image memory and transmitting it to a buffer memory, and reading the facsimile image binary data recorded in the image memory, coding and storing it in a memory.

To achieve the above object, there is also provided a method for operating the facsimile mail box service subscriber apparatus including the steps of: discriminating the type of a facsimile message as received; detecting an error according to the discriminated type and storing the received facsimile message; discriminating a transmittal mode of the facsimile message to be transmitted; and converting the facsimile data according to the discriminated transmittal mode and transmitting it.

To achieve the above object, there is also provided a method for operating the facsimile mail box service subscriber apparatus including the steps of:

discriminating whether a received facsimile data restored according to a protocol recommended by the ITU-T.4 is a data in ECM or a general facsimile compressed data; reverse-coding the general facsimile compressed data to a binary form in case that the received and restored facsimile data is a general facsimile compressed data, and detecting whether there is an error with it; restoring an error if the error is detected and storing a facsimile image binary data in a good condition in an image memory; and recording the facsimile image binary data stored in the image memory in the buffer memory, and recording the facsimile image binary data of the buffer memory in a storing unit when the recording is completed.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention.

In the drawings:

Figure 1 is a schematic view showing a construction of a general facsimile mail box service network in accordance with a conventional art;

Figure 2 is a schematic block diagram of the general facsimile mail box service subscriber apparatus in accordance with the conventional art;

Figure 3 is a schematic block diagram of a facsimile mail box service subscriber apparatus in accordance with the present invention;

Figure 4 is a flow chart of a method for receiving a facsimile message of

the facsimile mail box service subscriber apparatus in accordance with the present invention; and

Figure 5 is a flow chart of a method for transmitting a facsimile message of the facsimile mail box service subscriber apparatus in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

Figure 3 is a schematic block diagram of a facsimile mail box service subscriber apparatus in accordance with the present invention, which additionally includes a facsimile image data processor 30 and an image memory 31 into the conventional facsimile mail box service subscriber apparatus of Figure 1.

The same reference numerals are given to the same elements as in the conventional art.

The facsimile image data processor 30 decodes a general facsimile compressed data, that is a facsimile data that has been coded according to the recommendation of the ITU-T.4, applied from the facsimile controller 15 into a binary data, storing it in the image memory 31 and transmit it to the buffer memory 31.

In addition, the facsimile image data processor 30 reads the facsimile image binary data recorded in the image memory 31, codes the read facsimile image binary data according to the ITU-T.30 and stores it in the memory 16.

The image memory 31 stores the facsimile image binary data applied from

the facsimile image data processor 30 and the facsimile image binary data stored in the buffer memory 13.

The method for operating of the facsimile mail box service subscriber apparatus in accordance with the present invention will now be described with
5 reference to Figures 4 and 5.

1) The operation of recording the facsimile message transmitted from a PSTN switching system in the facsimile mail box service subscriber (The receiving operation) :

10 When the CPU 11 detects a facsimile message in a PCM form inputted from the PCM highway matching unit 14 (S11), it informs the facsimile controller 15 of the receipt of the facsimile message through the facsimile data storing unit connection unit 12. Then, the facsimile controller 15 informs the facsimile modem 17 of the receipt of the facsimile message (S12).

15 At this time, the PCM highway matching unit 14 receives a synchronous signal from the synchronous processor 18, converts a facsimile message in a PCM form inputted through the PCM highway to an analog signal and transmits the analog signal to the facsimile modem 17 (S13).

The facsimile modem 17 restores the analog signal transmitted from the
20 PCM highway matching unit 14 according to the protocol recommended by the ITU-T.4. The facsimile controller 15 reads the data restored by the facsimile modem 17 and discriminates whether it is a data in ECM.

If the read facsimile data is a data in ECM, the facsimile controller 15 stores the read facsimile data in ECM in the memory 16 (S23). Thereafter, the
25 facsimile controller 15 checks FCS (Frame Check Sequence) for the stored data in

ECM.

Upon checking, if no error is detected, the facsimile controller 15 transmits the data in ECM to the facsimile image data processor 30, and the facsimile image data processor 30 records the transmitted data in ECM in the buffer memory 13
5 through the facsimile data storing unit connection unit 12 (S25, S26).

Meanwhile, upon checking, if an error is detected, the facsimile controller 15 requests the PSTN switching system 4 to re-transmit the facsimile message (S19).

Meanwhile, if a facsimile data read in the stage 15 is a general facsimile
10 compressed data, the facsimile controller 15 directly transmits the general facsimile compressed data as read to the facsimile image data processor 30, not passing through the memory 15 (S16).

The facsimile image data processor 30 restores the general facsimile compressed data transmitted from the facsimile controller 15 to a binary data
15 (S17) and checks whether there is an error with it according to an MMR (Modified Modified READ) decoding method on the basis of the recommendation of the ITU-T.30 (S18).

Upon checking, in case that its error rate is more than 10% (a rate set to judge a refusal of receiving), the facsimile image data processor 30 refuses to
20 receive the corresponding data (S22). In case that its error rate is between 5% (a rate set to judge that data is good) and 10%, the facsimile image data processor 30 requests of re-transmitting of the corresponding data (S19). Meanwhile, in case that its error rate is less than 5%, the facsimile image data processor 30 stores the restored facsimile image binary data in the image memory 31 (S20). Consequently,
25 only the facsimile image binary data with no error or only a facsimile image binary

data in a good condition is stored in the image memory 31.

And then, the facsimile image data processor 30 reads the facsimile image binary data stored in the image memory 31 and records it in the buffer memory 13 through the facsimile data storing unit connection unit 12 (S21).

5 While the facsimile data is being stored in the buffer memory 13, the facsimile data storing unit connection unit 12 identifies whether the data is completely recorded in the buffer memory 13.

When the data is completely recorded, the facsimile data storing unit connection unit 12 outputs an interrupt signal to the CPU 11 to inform of the recording completion (S27, S28). And, the CPU 11 informs the control board that the data has been completely recorded in the buffer memory 13 through the control board information exchange memory 19. Accordingly, the corresponding control board reads the data stored in the buffer memory 13 and stores it in the external storing unit (S29).

15 As described above, in the present invention, when the facsimile message received from the PSTN switching system is stored in the facsimile mail box service subscriber apparatus, in case of the facsimile message in ECM, it is subject to the FCS checking to store a facsimile message with no error, while, in case of a general facsimile message, other than the message in ECM, it is converted to a facsimile image binary data and subject to an error checking, so
20 that only a facsimile message with no error is stored.

2) The operation of reproducing a facsimile message that has been recorded in the facsimile mail box service subscriber apparatus (That is, a transmitting operation) :
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The CPU 11 receives a message that there is a facsimile data to be transmitted in the buffer memory 13 from the control board through the control board information exchange memory 19 (S31). Upon receipt of it, the CPU 11 records the facsimile image binary data of the buffer memory 13 in the image memory 31 (S32).

Then, the facsimile image data processor 30 reads the facsimile image binary data recorded in the image memory 31, codes it according to the protocol recommended by the ITU-T.30 and stores it in the memory 15 (S33).

At this time, the facsimile image data processor 30 identifies whether the coded compressed data is to be transmitted in ECM (S34).

In case that the coded compressed data is to be transmitted in ECM, the facsimile image data processor 30 converts the coded compressed data to a frame data in ECM and transmits it to the facsimile modem 17. Meanwhile, in case that the coded compressed data is to be transmitted in a general facsimile compressed mode, rather than in ECM, the facsimile image data processor 30 converts it into a general facsimile compressed data and transmits it to the facsimile modem 17 (S35, S36).

Accordingly, the facsimile modem 17 converts the compressed data received from the facsimile image data processor 30 into an analog signal and transmits it to the PCM highway matching unit 14 (S37). Then, the PCM highway matching unit 14 receives a synchronous signal from the synchronous processor 18, converts the analog facsimile data to a PCM facsimile message and outputs it to the PSTN switching system (S38).

As so far described, according to the facsimile mail box service subscriber apparatus and its operating method of the present invention, when the facsimile

message is recorded, in case of a facsimile message in ECM, it is subject to the FCS checking to store a facsimile message with no error, while, in case of a general facsimile compressed message, it is converted to a facsimile image binary data and subject to an error checking to thereby store a facsimile message without
5 an error. Therefore, it is easy to detect an error of the facsimile data and restore it, so that a reliable facsimile service can be provided.

In addition, there is an effect that the facsimile data in a binary form is stored in the storing unit, so that it can be readily adopted to an applied field such as an Internet facsimile according to a construction of its system afterwards.

10 As the present invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and scope as defined in the appended claims,
15 and therefore all changes and modifications that fall within the meets and bounds of the claims, or equivalence of such meets and bounds are therefore intended to be embraced by the appended claims.

What is claimed is:

1. A method for operating the facsimile mail box service subscriber apparatus comprising:

- 5 a first step of discriminating the type of a facsimile message as received;
a second step of detecting an error according to the discriminated type and storing the received facsimile message;
a third step of discriminating a transmittal mode of the facsimile message to be transmitted; and
10 a fourth step of converting the facsimile data according to the discriminated transmittal mode and transmitting it.

2. The method according to claim 1, wherein the second step comprising:

- 15 a first sub-step of checking a FCS (Frame Check Sequence) in case that a received facsimile message is a data in ECM (Error Correction Mode) and storing the received facsimile message if no error is detected; and
a second sub-step of converting a general facsimile compressed data into a binary data in case that the received facsimile message is the general facsimile
20 compressed data, checking whether there is an error through an MMR (Modified Modified READ), and storing the received facsimile message if no error is detected.

3. The method according to claim 1, wherein the first step comprising
25 sub-steps:

storing a received facsimile message in a memory by means of a facsimile controller in case that the received facsimile message is a data in ECM after a type of the facsimile message is discriminated;

performing FCS checking for the stored facsimile message in ECM;

5 transmitting the facsimile message in ECM stored in the memory to a facsimile image data processor, in case that no error is detected in the FCS checking; and

storing the facsimile message in ECM in a buffer memory by means of a facsimile image data processor.

10

4. The method according to claim 3, further comprising a step of requesting a PSTN switching center to re-transmit the data, in case that an error is detected.

15

5. The method according to claim 2, wherein the second sub-step comprising steps of:

transmitting a received facsimile message to a facsimile image data processor, in case that the received facsimile message is a general facsimile compressed data upon discrimination of the type of the facsimile message;

20

decoding the received facsimile message to a facsimile image binary data by means of a facsimile image data processor;

checking whether there is an error according to an MMR decoding for the facsimile image binary data by means of the facsimile image data processor;

refusing to receive the data in case that its error rate of the data is larger
25 than a rate set for judging a refusal to receive a data, performing a re-transmission

request procedure in case that its error rate is larger than a rate set for judging that the data is good and smaller than a rate set for judging a refusal to receive it, and storing the decoded facsimile image binary data in an image memory in case that its error rate is smaller than a rate for judging that the data is good, upon
5 checking; and

reading the facsimile image binary data from the image memory and storing it in the buffer memory by means of the facsimile image data processor.

6. The method according to claim 1, wherein the third step
10 comprising sub-steps of:

recording the facsimile image binary data of the buffer memory in the image memory upon being informed of the facsimile image binary data transmission;

coding the facsimile image binary data recorded in the image memory by
15 means of the facsimile image data processor; and

discriminating a transmittal mode of the coded facsimile data.

7. The method according to claim 1, wherein the fourth step comprising sub-steps of:

20 converting a facsimile data to be transmitted to a frame data in ECM, in case that the facsimile data to be transmitted is discriminated to be a data in ECM; and

converting a facsimile data to be transmitted to a general facsimile compressed data in case that the facsimile data to be transmitted is not a data in
25 ECM upon discrimination.

8. A method for operating the facsimile mail box service subscriber apparatus comprising:

a first step of discriminating whether a received and restored facsimile data is a data in ECM or a general facsimile compressed data;

5 a second step of reverse-coding the general facsimile compressed data to a binary form in case that the received and restored facsimile data is a general facsimile compressed data, and detecting whether there is an error with it;

a third step of restoring an error if the error is detected and storing a facsimile image binary data in a good condition in an image memory; and

10 a fourth step of recording the facsimile image binary data stored in the image memory in the buffer memory, and recording the facsimile image binary data of the buffer memory in a storing unit when the recording is completed.

9. The method according to claim 8, wherein the third step
15 comprising sub-steps of:

refusing to receive the data in case that its error rate of the data is larger than a rate set for judging a refusal to receive a data;

performing a re-transmission request procedure in case that its error rate is larger than a rate set for judging that the data is good and smaller than a rate
20 set for judging a refusal to receive it; and

storing the reverse-coded facsimile image binary data in an image memory in case that its error rate is smaller than a rate for judging that the data is good.

25 10. The method according to claim 8, further comprising the steps of:

storing a received and restored facsimile data in a memory and checking whether there is an error through FCS checking, in case that the received and restored facsimile data is a data in ECM; and

storing the facsimile data in ECM in a buffer memory in case that no error
5 is detected.

11. The method according to claim 8, further comprising the steps of:
reading a facsimile image binary data from the buffer memory and
recording it in the image memory, in case that the buffer memory has the facsimile
10 image binary data;

reading the facsimile image binary data from the image memory and
coding it; and

identifying the transmittal mode of the coded data, converting it to a
corresponding data form according to the transmittal mode, and transmitting it.
15

12. The method according to claim 11, further comprising:
converting the coded data to a frame data in ECM in case that the
transmittal mode is an ECM; and

converting the coded data to a general facsimile compressed data form in
20 case that the transmittal mode is not an ECM.

13. A facsimile mail box service subscriber apparatus having a
facsimile controller for processing a facsimile protocol and a facsimile data, a
buffer memory for storing data to be received and transmitted from and to an
25 external unit, and a memory for storing the facsimile data, comprising:

an image memory for storing a facsimile image binary data; and

a facsimile image data processor for receiving a coded facsimile data from
a facsimile controller, reverse-coding the facsimile data to a binary data, storing it
in the image memory and transmitting it to a buffer memory, and reading the
5 facsimile image binary data recorded in the image memory, coding and storing it in
a memory.

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ABSTRACT OF THE DISCLOSURE

A facsimile mail box service subscriber apparatus and its operating method are disclosed by which when the facsimile message is recorded, in case of a facsimile message in ECM, it is subject to the FCS checking to store a facsimile message with no error, while, in case of a general facsimile compressed message, it is converted to a facsimile image binary data and subject to an error checking to thereby store a facsimile message without an error. Therefore, it is easy to detect an error of the facsimile data and restore it, so that a reliable facsimile service can be provided. In addition, there is an effect that the facsimile data in a binary form is stored in the storing unit, so that it can be readily adopted to an applied field such as an Internet facsimile according to a construction of its system afterwards.

FIG. 1
BACKGROUND ART

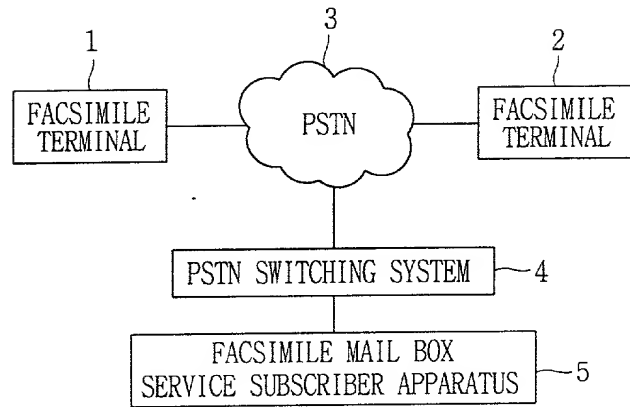


FIG. 2
BACKGROUND ART

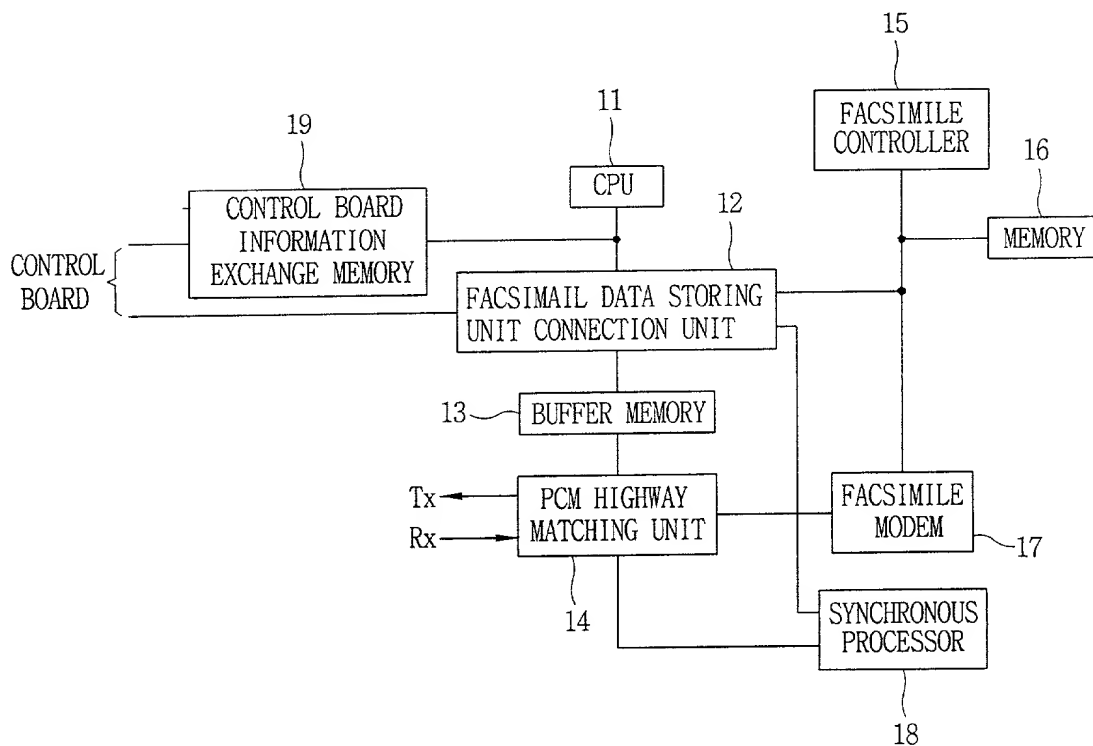


FIG. 3

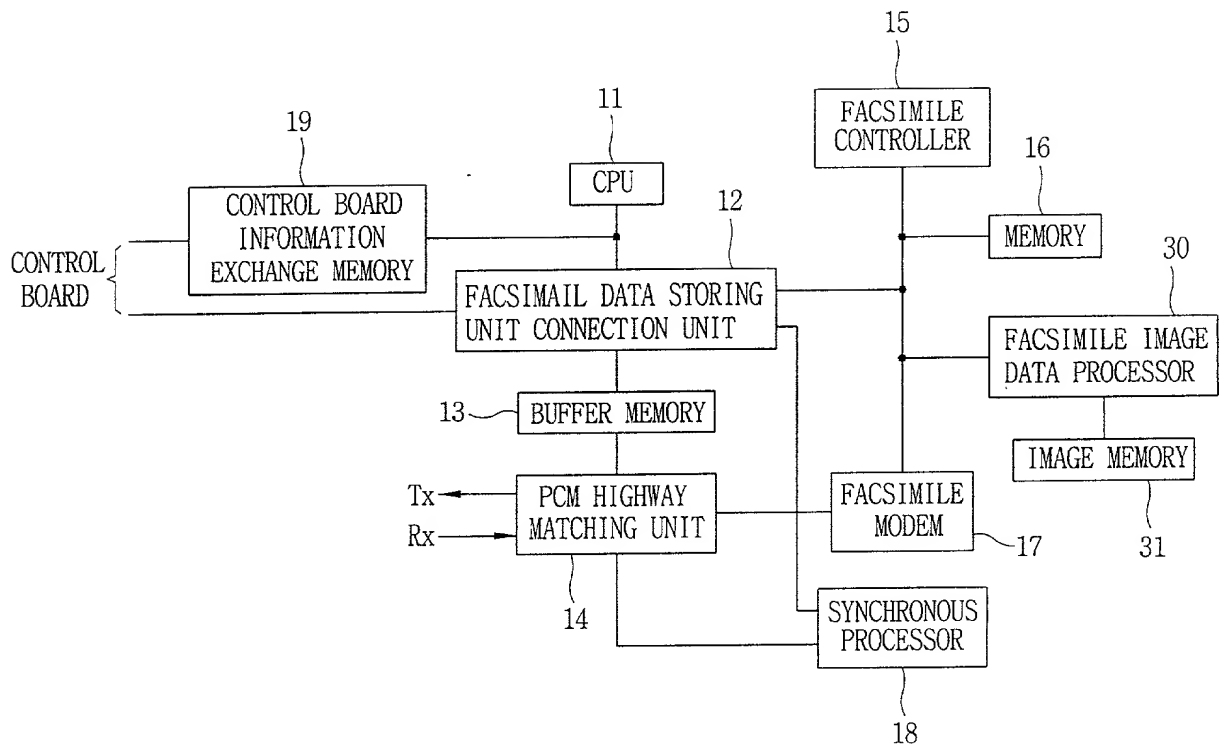


FIG. 4

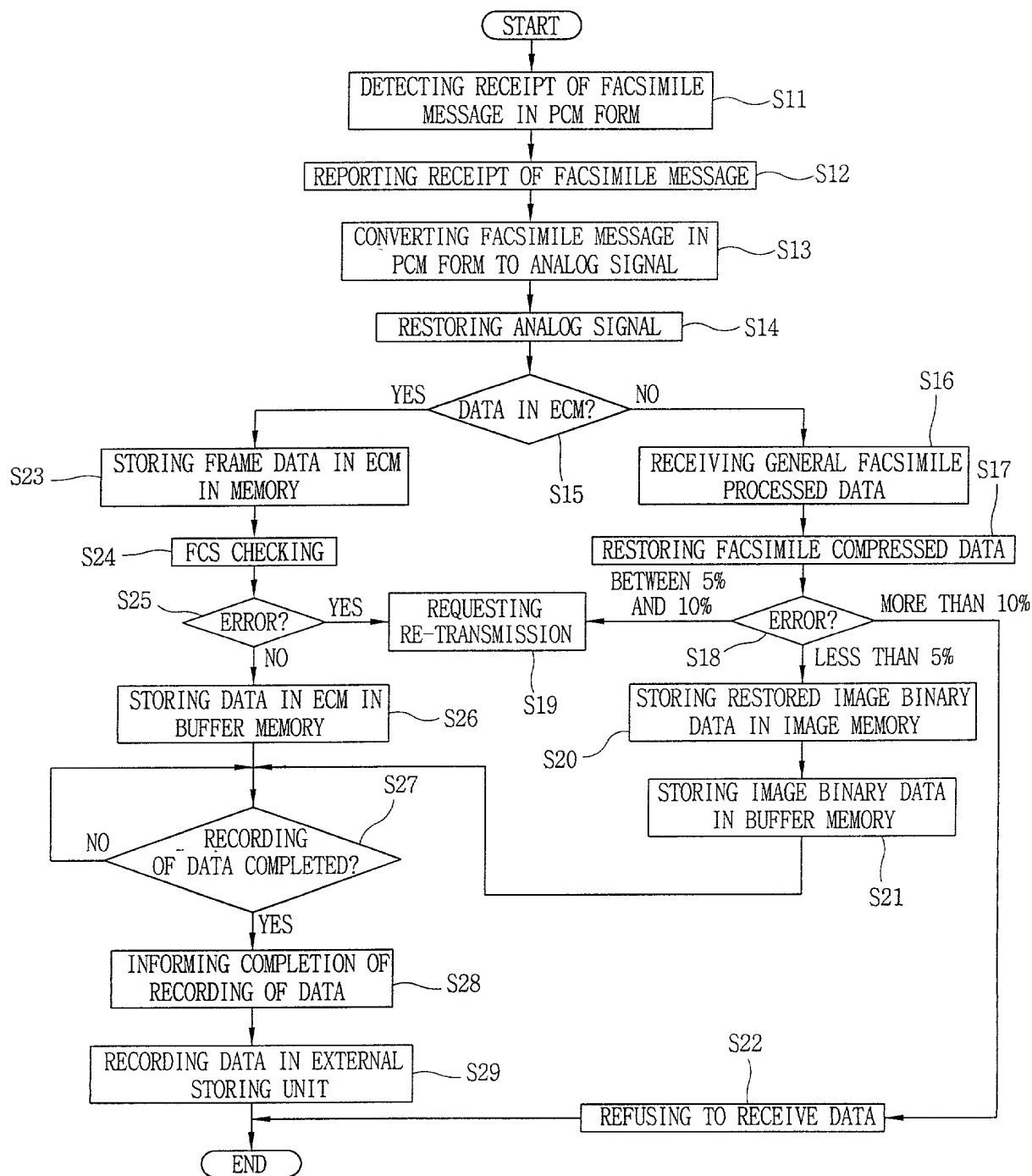
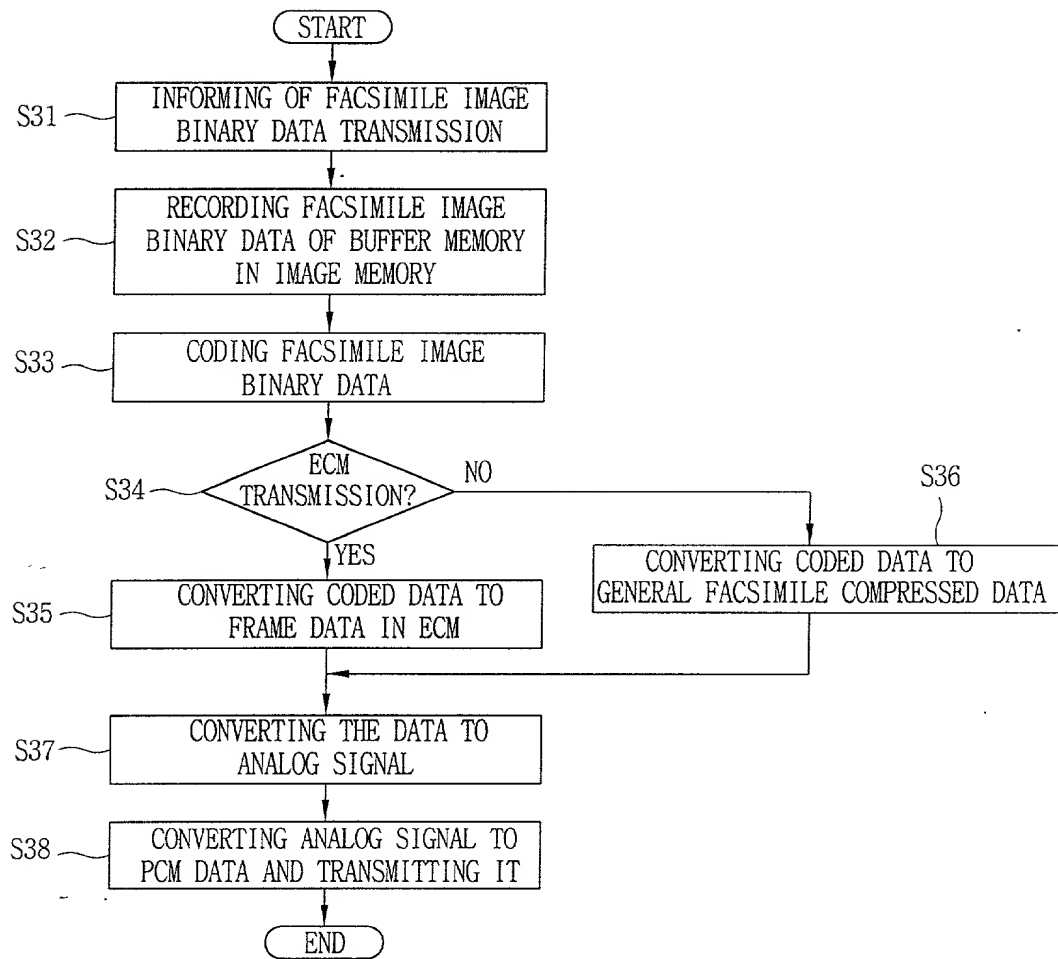


FIG. 5



Docket No.:

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter claimed and for which a patent is sought on the invention entitled FACSIMILE MAIL BOX SERVICE SUBSCRIBER APPARATUS AND OPERATING METHOD THEREOF, the specification of which

[X] is attached hereto [] was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known to me to be material to patentability in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s):
Number

Country

Foreign Filing Date
Month/Day/Year

42004/1999

Republic of Korea

November 5, 1999

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)

Filing Date(Month/Day/Year)

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application Designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Prior U. S. Application
or PCT Patent Number

Filing Date(Month/Day/Year)

Parent Patent Number(if application)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorney(s) and/or agent(s): Daniel Y.I. Kim, Registration No. 36,186 and Mark L. Flesher, Registration No. 34,596; Carl R. Wesolowski, Registration No. 40,372, John C. Eisenhart, Registration No. 38,128, and Rene A. Vazquez, Registration No. 38,647; Michael J. Cornelison, Registration No. 40,395; and Stuart I. Smith, Registration No. 42,159, all of

FJ.FSHNER & KIM
P.O. Box 221200
Chantilly, Virginia 20153-1200

with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and all further correspondence should be addressed to them

Full name of solo or first inventor: Ju-Hwan KIM

Inventor's signature: JU HWAN KIM

Date: 11/01/2000

Residence: Seoul, Korea

Citizenship: Republic of Korea

Post Office Address: family Apt. 210-305, Moonjeong 2-Dong, Songpa Ku, Seoul, Korea

Full name of joint inventor(s):

Inventor's signature:

Date:

Residence:

Citizenship:

Post Office Address:

Full name of joint inventor(s):

Inventor's signature:

Date:

Residence:

Citizenship:

Post Office Address: